

EOSINOPHILIA IN EAST AFRICAN AND MAURITIAN TROOPS

AN ANALYSIS OF 150 CASES

BY

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EOSINOPHILIA is a rare finding in British troops at home or overseas. Service doctors, however, may frequently find it in troops of other nationalities. This study has been carried out, during the course of six months' routine work in the medical wards of the largest military hospital in the Middle East, to discover the causes and degree of eosinophilia that occurred. I have been unable to trace published accounts of any similar series.

MATERIAL

Besides the men of the British Army and local civilians, large numbers of East African and Mauritian troops have been employed in the Canal Zone of Egypt, and it is from these men that this series has been drawn. It must be emphasized that no special search was made for these cases and that all were in-patients of this hospital, eosinophilia being found in the course of routine investigation. In a consecutive series of 178 cases of eosinophilia a cause was found for 150 cases, and these form the basis of this study. In the remaining 28 no cause for the eosinophilia could be found in spite of very thorough investigation of about half of these, while the remainder were inadequately examined due to circumstances beyond my control.

Eosinophilia was regarded as being present if there were more than 250 eosinophils per c.mm. in the peripheral blood whatever the percentage of the total white blood cells, Discombe (1946) having shown that the normal range is 0-240 per c.mm. The degree of eosinophilia was divided into four grades according to the total eosinophil count as follows: Grade I (minimal) 250-499 per c.mm., Grade II (mild) 500-999 per c.mm., Grade III (moderate) 1,000-2,999 per c.mm., and Grade IV (gross) 3,000 or more per c.mm. After a total and differential white cell count had been performed, in some cases a total eosinophil count was made also (*e.g.*, in Grades I and IV) using the method described by Discombe (1946).

INCIDENCE

Race. Sixty-six Africans and 84 Mauritians compose this series, the only selective factor having been the fact that all cases were personally seen by the author.

Age. Men in both the East African and the Mauritian groups were naturally of a similar age distribution. Allowing for 10 East Africans who did not know their age, most men were aged 19-23 years with a range of 18-50 years.

Degree of eosinophilia. The highest total eosinophil count that each man showed was graded. A moderate (Grade III) eosinophilia was found most frequently (Fig. 1). It was also the commonest grade in the 28 cases for which no cause could be discovered (Table 1). The highest total eosinophil count of the series was 13,900 per c.mm. in a case of ancylostomiasis.

ÆTIOLOGY

Intestinal parasites were by far the commonest cause of eosinophilia (148 cases). Infection of the bladder by *Schistosoma hæmatobium* accounted for 6 cases, while *Acanthocheilonema perstans*, which is believed to be non-pathogenic but which causes an eosinophilia, was present in the blood of 2 East Africans. At least two causes of eosinophilia were present in some cases. Each possible cause has been recorded separately for the purpose of this study (Fig. 2).

In Fig. 3 the incidence of the various worm infestations found in this series is shown graphically. It will be seen that the commonest parasite in East Africans and Mauritians is the ubiquitous hookworm, which in the Mauritians was usually associated with the non-pathogen *Trichuris*. *Tænia* was common in the East Africans but rare among the Mauritians, whereas the reverse is true of *Ascaris lumbricoides*. No case of *Schistosoma mansoni* infection of the bowel was discovered among the Mauritians, but 9 cases occurred in the East Africans. *Strongyloides stercoralis* was found in 12 Mauritians but in only 2 Africans. The incidence of *Schistosoma hæmatobium* was low in both groups although higher in the Africans; most cases also had at least one species of intestinal parasite.

Helminthiasis does not necessarily provoke an eosinophilia. During this investigation 15 cases were found to have no eosinophilia, 5 having more than one species of worm (Table 2).

Table 1. *To show distribution of undiagnosed cases according to grade of eosinophilia and race*

| | Total cases | Percentage in Grade | | | |
|------------------|-------------|---------------------|----|-----|------|
| | | I | II | III | IV |
| East African ... | 20 | 0 | 10 | 70 | 20 |
| Mauritian ... | 8 | 37.5 | 0 | 50 | 12.5 |

Table 2. *To show the incidence of the various helminths in patients with no eosinophilia*

| Parasite | East Africans 6 cases | Mauritians 9 cases |
|-----------------------|--------------------------|-----------------------|
| <i>Tænia</i> sp. | 2 | 3 |
| <i>A. duodenale</i> | 3 | 3 |
| <i>S. mansoni</i> | 1 | 0 |
| <i>S. hæmatobium</i> | 1 | 0 |
| <i>Trichuris</i> | 0 | 6 |
| <i>S. stercoralis</i> | 0 | 1 |

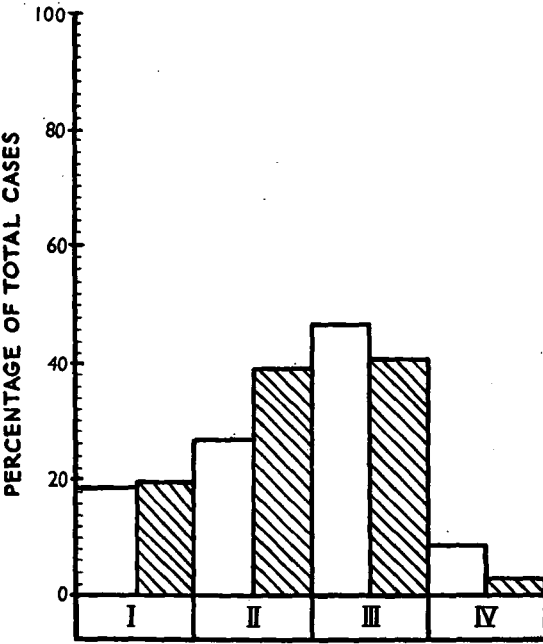


FIG. 1. Diagram to show the distribution of the four grades of eosinophilia in East Africans (plain blocks) and Mauritians (shaded blocks).

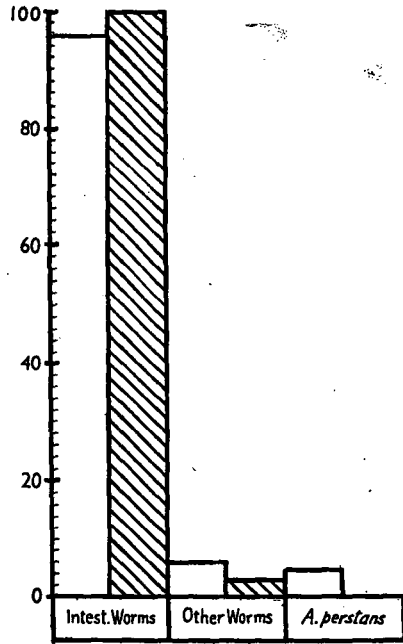


FIG. 2. Diagram to show the incidence of the causes of eosinophilia in East Africans and Mauritians.

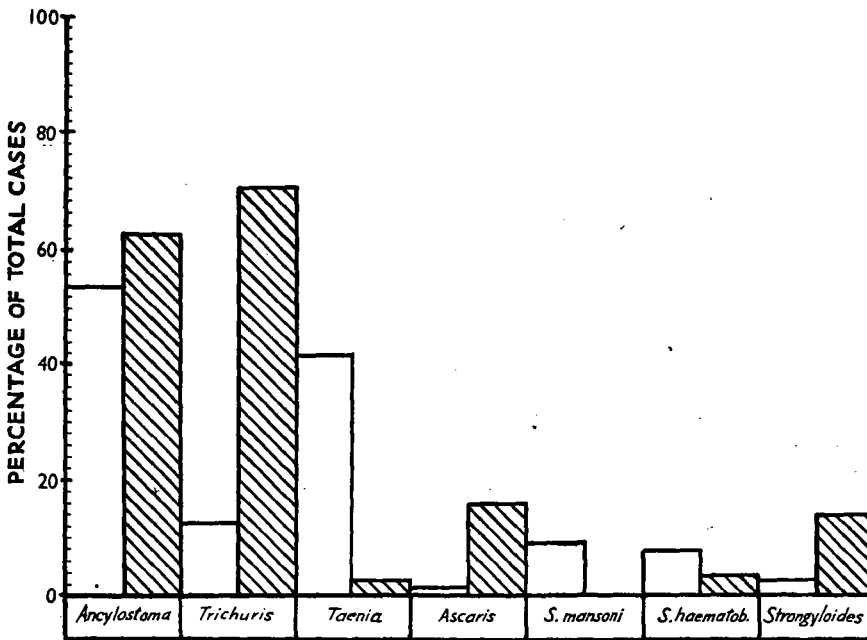


FIG. 3. Diagram to show the incidence of helminths causing eosinophilia in East Africans and Mauritians.

ANCYLOSTOMIASIS

Ancylostomiasis often causes anæmia, but only one man was found with a hæmoglobin of less than 11.0 g. per cent. in the 90 cases seen in this series. An East African, he had 6.4 g. Hb. per cent., 2.6 M. red cells per c.mm. and a mean corpuscular hæmoglobin concentration of 27.9 per cent. (W.B.C. 5,300 per c.mm. with 33 per cent. neutrophils, 40 per cent. eosinophils, 24 per cent. lymphocytes and 3 per cent. monocytes). Cronk (1954), when working with a similar group of patients, found 7 had hæmoglobin below 70 per cent. (Haldane) out of 31 cases of hookworm infestation.

BRONCHITIS

It was noticed during the course of this investigation that some previously fit young men were admitted to hospital with acute bronchitis, which in some cases recurred. Five such Mauritians and three East Africans had an eosinophilia for which no cause could be found and are therefore not included in the 150 cases of this series. It seems possible that the eosinophilia and bronchitis were originally caused by the migration of parasitic larvæ through the lungs before the adult female worms were present in the intestine to produce ova, but against this is the fact that they had not been home (and thus exposed to infection) for an average of 23 months (9-34 months). There is no evidence to suggest that the men were infected while serving in the Canal Zone. Extensive searches of the sputum (cleared with sodium hydroxide or trypsin) failed to demonstrate any larvæ. In some cases a proportion of the pus cells in the sputum were eosinophils, which in one case formed 70 per cent. while the peripheral blood contained only 7 per cent. No direct relationship could be demonstrated between the number of eosinophils in the sputum and the severity or duration of the bronchitis or the eosinophil count in the peripheral blood.

In addition to these, one East African appeared to have pulmonary eosinophilia in that radiologically there was some mottling of both lung fields and a small (1.0 × 0.75 cm.) solid right mid-zone opacity which was discovered on routine radiography and was the cause of his admission to hospital. No cause for the eosinophilia (total eosinophils 5,000 per c.mm.) was demonstrated, and no evidence of tuberculosis or other bacterial infection was present.

SUMMARY

A series of 150 cases of eosinophilia is described. The differing pattern of ætiology in East Africans and Mauritians is demonstrated. The relationship between bronchitis and eosinophilia is discussed.

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